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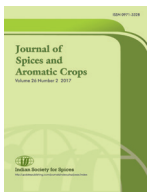

Marketing channels, dynamics and economic incentives for onion production in Ethiopia: A case study from Oromiya Regional State, Ethiopia

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Abstract

This research was initiated to assess the market channels and develops value chain map and econometric model outputs for the onion in Ambo and Toke Kutaye districts of West Showa Zone, Oromiya Regional State, Ethiopia. Primary data were collected using interview guided questionnaires from 183 respondents' of different actors in onion value chain and four focus group discussions of onion producers. Descriptive and inferential statistics; value chain mapping; marketing margin analysis; and econometrics analysis were used to analyze the data. About four marketing channels were identified in the study areas. The econometric result showed that education level of household, onion farming experience, number of oxen owned, land size used for onion farming, amount of fertilizer used, access to extension services and family size of house hold were variables those significantly influenced the marketable supply of onion at farmers level. Multiple linear regression model indicated that variables like age, farm experience, family size, selling price and improved inputs were significant in affecting onion marketable supply. Thus, to increase the onion productivity and maximize the profits of all value chain actors, it is important to integrate all concerned bodies of the onion value chains along with the supporting sectors.

Keywords: actors, marketable supply, marketing channel, multiple liner regression model, onion & value chain analysis

Introduction

In Ethiopia agriculture is the most important sector, crucial for the country's food security and the livelihoods of nearly 85% of its people. Agriculture sector accounts for nearly 46% of GDP, 73% of employment, and nearly 80% of foreign export earnings (ATA 2014). The sector continues to face a number of problems and challenges like adverse climatic conditions, lack

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of appropriate land use system, low technology adoption, the predominance of subsistence agriculture, lack and/or absence of business oriented agricultural production system, and limited or no access to market facilities resulting in low participation of the smallholder farmers in value chain or value addition of their produces (Bezabih 2010).

In other way, globalization and expanding international markets as well as the fast-growing middle and high income classes in many developing countries offer opportunities for developing country producers like Ethiopia to operate in emerging national and international markets (Dolan & Humphrey 2004). These opportunities can be utilized efficiently through value chain development approach that helps to boost production, productivity and efficiency of small holders and other actors in agricultural value chains. Therefore, it is becoming increasingly crucial for policy makers to focus on value chain development approach in agricultural development in order to develop efficient agricultural value chains; those can increase significantly the rate and scope of agricultural and industrial growth of developing countries (UNIDO 2009).

Onion (*Allium cepa* L.) is considered as one of the most important vegetables produced on large scale in Ethiopia for both commercial and consumption purposes. It can be grown under a wide range of climatic conditions (FAO 2005). It grows well under mild climatic conditions without extreme heat or cold or excessive rainfall. According to Olani & Fikre (2010), in Ethiopia onion is produced in many parts of the country by small farmers, private growers, state enterprise mainly in Awash Valley and Lake Region.

Even if, the country has a great potential to produce onion every year for both domestic and export market, there are other problems that affect the marketing activities of onion produce in Ethiopia. Some of them are price fluctuation or low pricing at peak supply period, lack of standards for produce, lack of coordination among producers, inadequate availability of market research and marketing information, weak linkage in the chain, lack of storage facilities and poor road access (Adugna 2009; Almaz *et al.* 2014).

Despite the potential from onion farming and significant performance gap on productivity and marketing of onion in Ethiopia, there was no research done that assessed the production and marketing performance of onion value chain in the study areas. Thus, this research was initiated with the objectives of assessing the market channels and developing value chain map and econometric model outputs for the onion in the study areas.

Materials and methods

Description of study areas

This study was conducted in West Showa Zone, Oromia Regional State (Ethiopia) in two major onion growing districts (namely Ambo and Toke kutaye). The detail Quantitative description of the districts is explained by different parameters below (Table 1).

Research design and sampling

Survey type of research design was used to conduct this study. The population of the study covered both Ambo and Toke kutaye districts which were selected purposively because of they are known for onion production from 18 districts of West Showa Zone. The target populations of the study also covered all actors participating starting from input suppliers up to final consumers of the onion value chain in the study areas. According to the data obtained from two districts' Irrigation Development Authority Offices; totally there were 3505 male and 769 female onion growers' households in the study areas during 2014/15 production year. The household sampling design is given in Table 2.

In addition to 151 sample respondents of onion producers, further data sources were also selected from the other value chain actors

Table 1. Quantitative description of the districts

Description	Ambo*	Toke kutaye**
Total area of land	835.97 km^2	788.87 km^2
Geographical location	8°47'N-9° 21'N & 37°32'E-38°3'E	08^{0}N59'01.1N & 37^{0}E46'27.6E
Altitude range	1500-3100 MSL	1500-3194 MSL
Temperature range	23°c-25°c	15 °c - 29°c
Average annual rainfall	1000-1700 mm	1000-1588 mm
Total population	121,744	134,767
Male	60734	66,492
Female	61010	68,275
Agro climatic zones		
Low land	17%	18%
Mid land	60%	55%
High land	23%	27 %
Number of kebele/village/		
Rural	32	31
Urban	1	4

Sources: *Ambo & **Tokekutaye Districts' Agriculture Offices, 2014

namely; input suppliers, traders, consumers, and supporting service providers. All four private vegetable seed suppliers located in Ambo and Guder towns were purposively included. From four legally licensed multipurpose cooperatives existing in those selected kebeles; three of them were randomly selected. Wholesalers and retailers surveys were conducted at districts market towns. The lists of legally licensed wholesalers and retailers obtained from the respective district office of Trade and Industry. From legally licensed five wholesalers, three wholesalers of onion were selected randomly. In addition, from eight legally licensed onion retailers, four retailers were randomly selected from both Ambo and Guder markets. From extension service support provides one district level concerned expert was

Table 2. Households sample design

District	Sample kebele	Total number of HHs			Sample HHs		
		Male	Female	Total	Male	Female	Total
Ambo	Gosu Qora	73	15	88	15	3	18
	Ilamu Goromti	67	9	76	14	2	16
	Awaro	85	11	96	18	2	20
Toke kutaye	Imala Dawe Ajo	150	25	175	31	5	36
	Birbissa Dogoma	90	20	110	18	4	22
	Naga File	95	10	105	19	2	21
	Maruf	59	27	86	13	5	18
Total		619	117	736	128	23	151

Source: computed from data collected from the two districts' Irrigation Development Authority Offices

purposively selected from both Cooperative promotion and Irrigation Development Authority Offices of the respective districts. Furthermore, three individual consumers, two Hotels and two institutional consumers were selected randomly from each district. Totally, 183 sample respondents were selected from various stages of value chain actors in the study areas.

Methods of data analysis and procedure

The questionnaires were checked for clarity and consistency in answering questions. This was followed by coding of answers and data entry into the computer for analysis. Statistical package for social science (SPSS) version 20.0 and STATA version 11.0 are used for entering data to computer and analysis of data.

Marketing margin analysis

Estimates of the marketing margins are the tools to analyze performance of market. Marketing margin was calculated by taking the difference between producers' and consumers' prices. The producers' share is the commonly employed ratio calculated mathematically as, the ratio of producers' price to consumers' price. Mathematically, producers' share can be expressed as:

$$PS = Pp/ CP = 1 - (GMM/ Cp) \quad (1)$$

Where, PS=Producer's share; Pp=Producer's price; Cp=Consumer price; GMM=Marketing margin

GMM = (End buyers price) – (producers price)

Where, GMM=Gross marketing margin

The above equation tells us that a higher marketing margin, diminishes producers share and vice versa. It also provides an indication of welfare distribution among production and marketing agents. Calculating the total marketing margin was done by using the following formula. Computing the Total Gross Marketing Margin (TGMM) is always related to the final price paid by the end buyer and is expressed as a percentage (Mendoza 1995).

$$\text{Total Gross Margin} = [(\text{End buyer prize} - \text{Producer/Seller price}) / (\text{End buyer prize})] \times 100 \quad (2)$$

It is useful to determine the portion of the price paid by the consumer that goes to the producers. The producers' margin is calculated as:

$$GMMP = [(\text{Price paid by end buyer} - \text{Marketing gross margin}) / (\text{End buyer price})] \times 100 \quad (3)$$

GMMP=Producers' gross Marketing Margin

To find the benefit share of each actor the same concept was applied with some adjustments. Marketing margin at a given stage 'i' (GMM_i) was computed as:

$$GMMi = (SPi - PP) / (TGMM) \times 100 \quad (4)$$

Where: SP_i=selling price at i^{th} link; PP_i=purchase price at i^{th} link.

Net Marketing Margin (NMM) is the percentage over the final price earned by the intermediary as his net income once his marketing costs are deducted. The equation tells us that a higher marketing margin diminishes the producer's share and vice-versa. It also provides an indication of welfare distribution among production and marketing agents.

$$NMM = (\text{Gross marketing margin} - \text{Marketing cost}) / (\text{Consumers price}) \quad (5)$$

From this measure, it is possible to see the allocative efficiency of markets. Higher NMM or profit of the marketing intermediaries reflects reduced downward and unfair income distribution, which depresses market participation of smallholders. An efficient marketing system is where the net margin is near to reasonable profit.

Econometric analysis

In this study, Multiple Linear Regression model was used to analyze factors affecting farmers' level marketable supply of onion in the study areas. This model was selected for its simplicity and practical applicability (Greene 2000). Econometric model specification of supply function was as the following.

$$Y = X' \hat{a} + U$$

Where, Y =quantity of onion supplied to market; X'=a vector of explanatory variables; $\hat{a}$=a vector of estimated coefficient of the explanatory variables; U=disturbance term

Results and discussion

Demographic characteristics of sample households

The demographic and socioeconomic characteristics of the sample respondents characterized the onion crop production and marketing systems (Tables 3 & 4). Majority of the household respondents were male (87.04%) who taken part in crop production, management & marketing activities of onion as households head in the study areas.

The educational background of the sample household head is believed to be an important feature that determines the readiness of household heads to accept new ideas and innovations. About 42.59% and 47.42% of the sample household heads were illiterate in Ambo and Toke Kutaye districts, respectively. The marital statuses of the majority of households head in the districts were married.

The average households head age was 40.7 and 39.84 years along with an average family size of 5.22 and 5.48 persons in Ambo and Toke Kutaye Districts, respectively (Table 4). The study showed that there was no significant family size difference between the two districts as it was indicated in independent sample t-test. The study indicated that the average age of the households' respondents were in active productive age. In other way, the study showed that average family size of households' respondents in the study areas also more than five persons per household. Thus, if they are efficiently engaged in production activities there were labor opportunities to increasing production and marketable supply of onion in study areas.

Table 3. Demographic and socioeconomic characteristics of producers (categorical variables)

Variables	Items (n=54)	AmboToke kutaye (n=97)		Total (n=51)		χ^2-test		
		N	%	N	%	N	%	
Sex	Female	7	12.96	16	16.49	23	15.23	0.34
	Male	47	87.04	81	83.51	128	84.77	
Education level	Illiterate	23	42.59	46	47.42	69	45.70	7.59*
	Primary	14	25.93	35	36.08	49	32.45	
	Secondary	7	12.96	11	11.34	18	11.92	
	Diploma	10	18.52	5	5.15	15	9.93	
Marital Status	Married	49	90.74	94	96.91	143	94.70	4.98
	Single	1	1.85	2	2.06	3	1.99	
	Divorced	2	3.70	0	0	2	1.32	
	Widowed	2	3.70	1	1.03	3	1.99	

Note: N=sample size, and * is significant at 10% significance level

Source: Own computation from survey result, 2014/15

Table 4. Demographic and socioeconomic characteristics of producers (continuous variables)

Variables	Ambo (n=54)		Toke kutaye (n=97)		Total (n=151)		t-test
	Mean	SD	Mean	SD	Mean	SD	
Age	40.76	9.07	39.33	8.66	39.84	8.80	0.9560
Family size	5.22	1.94	5.49	1.97	5.39	1.96	-0.7874
Experience	3.85	1.92	3.33	1.46	3.52	1.65	1.8803*

Note: N=sample size,* is significant at 10% significance level

Source: Own computation from survey result, 2014/15

It was found that farmers in Ambo have more years of experience in onion farming as compared to those of Toke Kutaye. The study also indicated that majority of farmers in the study areas started onion production in more recent times. The independent sample t-test revealed that there was difference at 10% level of significance on the mean years of onion farming experience between two districts which indicated that more experienced farmers in onion production were in Ambo district to increase productivity and marketable supply of onion produce than in Toke kutaye district. This result is supported by the findings of Almaz *et al.* (2014) who found that lack of production and marketing skill and farming experience affected negatively the marketing activities of onion and the improvement of onion value chain in Ethiopia.

Production status of the households

There was a significant difference in land allocation for onion production at 5% significant level between two districts. Land size allocated for onion farming was smaller in Ambo district as compared to Toke Kutaye district. On average 0.25 ha and 0.33 ha were allocated for onion production in two districts, respectively (Table 5). However, the mean yield of onion was 108 and 99.19 q ha^{-1} in Ambo and Toke Kutaye districts, respectively. There were a significant difference in yield/ha between the two districts at 10% significant level. This indicated that more land was allocated for onion in Toke Kutaye as compared to Ambo district; but the mean yield of onion was lower. This might be due to affects like low farming experiences, number of oxen owned and education level of household respondents as it was showed in this descriptive analysis result (Table 5). In both districts the average yield produced per hectare was far lower than the potential yield recorded in research centers (400 q ha^{-1}) (Dawit *et al*. 2004). There were also huge differences in yield ha^{-1} among the households. This difference might be associated with socio economic difference between each household

Table 5. Land allocation for onion farming and average yield ha^{-1} of producers

Variables	Ambo (n=54)		Toke kutaye (n=97)		Total (n=151)		t-test
	Mean	SD	Mean	SD	Mean	SD	
Land used for onion farming	0.25	0.18	0.33	0.19	0.299	0.189	-2.2691**
Average yield q ha^{-1}	108	31.0	99.19	24.81	102.35	27.42	1.9179*

Note: N=sample size, ** and * are significant at 5% and10% significance level, respectively

Source: Own computation from survey result, 2014/15

those discussed above in this descriptive analysis section.

There was a statistically significant difference between the two districts in average quantity of onion production at 10% significance level. On average the quantity of onion production per sample household respondent was 30.66 q. However, Ambo farmers produced 26.75 q, which was less than that of Toke Kutaye farmers who produced 32.85 q household^{-1} (Table 6). This indicated that the quantity supply of onion per sample household respondents of Toke Kutaye was greater than Ambo district; this might be due to the more average land allocated for onion production by the producers (Table 6).

About 29.58 q of onion per household was supplied to market in 2014/15 production year on average with an average percentage consumption of 0.88% per individual household out of the total production. The independent t-test indicated that there was statistically significant difference at 10% significance level on the average quantity of marketable supply of onion between households of the two districts, recording more amount of marketable supply of onion in Toke Kutaye than Ambo district.

The pattern of use of onion produce at farmers' level was 96.45%, 0.88% and 2.67% for marketable supply, consumption and loss of produce, respectively. This indicated that farmers produced onion mainly for commercial purpose. The study result also support by the report of FAO (2005) that onion production was mainly for commercial purposes to generate income that support the livelihood of farmers in Ethiopia.

Marketing channels and value chain

The total amount of onion produced by household respondents in 2014/15 production year was 4,630.75 q in the study areas. The result of the study also showed that the marketable supply of onion which flow in the identified onion marketing channels was estimated to 4,466.20 q. The four major marketing channels and the share of each channel member in terms of quantity were developed in Fig. 1.

Channel analysis showed; retailers, consumers and wholesalers received 51.7%, 35.47% and 12.83% of onion directly from producers, respectively. The channel of Producer – Retailers – Consumer carried the largest quantity followed by Producer–Consumer; Producers – Wholesalers –Retailers – Consumers; and Producer – Wholesalers – Consumer. This study indicated that the majority of onion produce reached the final consumers through intermediaries (Wholesaler and retailers). These intermediaries duplicate costs without changing the form of the produce except time and place utility. This finding is supported by the result of (Adugna 2009; Almaz *et al.* 2014) who found that lack of coordination among producers in the form of cooperative limit the

Table 6. Household consumption and marketing of onion

Variables	Ambo (n=54)		Toke kutaye (n=97)		Total (n=151)		t-test
	Mean	SD	Mean	SD	Mean	SD	
Onion produced (q)	26.75	21.6	32.85	21.74	30.66	21.82	-1.6558*
Quantity supply (q)	25.77	20.94	31.70	20.96	29.58	21.08	-1.6672*
% Consumption	1.06	0.94	0.78	0.90	0.88	0.92	1.8257*

Note: N=sample size, and * is significant at 10% significance level

participation of producers in the onion market to receive fair price for their produce in Alamata district. As a result both producers and consumers are affected due to this duplication of costs.

Value chain map of onion in the study areas

This value chain map visualized the flow of the product and information along various chain actors. It shows different actors involved in the onion value chain, their roles and linkages (Fig. 1).

Profitability analysis of onion at producers' level

The result indicated that the average yield ha^{-1} of onion was 102.35 q in the study areas. The average marketing cost and produce losses were 67.25 and 18.99 Birr q^{-1}, respectively with an average return per quintal (selling price) of 711.39 Birr q^{-1}. Also, on average a producer got a net profit of 435.97 Birr q^{-1} from onion production in the study areas (Table 7). This indicated that revenue obtained was greater than total costs at producers' level. Even if, it didn't reached maximum productivity potential, the production of onion was profitable business at this stage in the study areas.

Expenditure per hectare on various activities performed during production and marketing system of onion for producers in the study areas were given below (Table 8). Thus, this result indicated that the farmers expended large amounts of money (61.79%) of its costs for input and labor costs in onion production and

Table 7. Average cost, return and profit of producers (Birr ha^{-1}) in 2014/15

List of cost items	Unit	Amount ha^{-1}	Birr $Unit^{-1}$	Cost ha^{-1} (Birr)
DAP Fertilizer	q	0.68	1,355.15	921.50
UREA Fertilizer	q	0.54	1,092.86	590.15
Insecticide	Lt	1	240	240
Improved seed	Kg	4.75	1,800	8,550
Rental value of land	ha	1	2600	2,600
Human labor	No	160	35	5,600
Oxen labor	Pair oxen	12	75	900
Produce loss	q	2.73	711.39	1,942.10
Transportation cost	Birr	98.74	17.5	1,727.95
Value added activities cost	Birr		20.75	2,048.86
Loading and unloading cost	Birr		5	493.7
Commission cost	Birr		10	987.4
Other over head costs	Birr		6	592.44
Total cost	Birr			27,194.10
Average selling price Qt^{-1}	Birr		711.39	
Revenue ha^{-1} of production	Birr		70242.65	
Gross profit ha^{-1}	Birr		43,048.55	
Gross profit Qt^{-1}	Birr		435.97	

Source: Study result, 2014/15

Table 8. Proportion of average production and marketing cost ha^{-1} of onion producers

Types of costs	Amount (Birr)	% Share
Input cost	10,301.65	37.89
Labor cost	6,500	23.9
Value added cost	4,270.51	15.70
Other costs	3,521.94	12.95
Opportunity cost of land (Rental value)	2,600	9.56
Total	27,194.10	100

Source: Own calculation based on study data, 2014/15

marketing system in the study areas. This showed that they were the most important inputs in production activities.

Marketing margin and benefit shares of actors in onion value chain

Different types of production cost and marketing cost related to the transaction of onion by producers, wholesalers, retailers; marketing margin and the benefit share of each marketing actors were indentified in the study areas (Table 9). Traders got a profit margin of 52.31%, while farmers, doing all the work of producing onion and bearing the associated risks, took only 47.69% of the profit margin compared to traders from the total of profit margin in the marketing channel. This might be due to traders were price makers in the study areas.

Each of the onion value chain actors added value to the product as the produce passes from one actor to another. In a way, the actors add value of the produce by performing activities like curing, cleaning, sorting and packaging. The value added activities costs of producers were higher than traders (whole sellers and retailers) (Table 10).

This study indicated that the producers performed cleaning; curing; sorting; and

Table 9. Onion marketing costs and benefit shares of actors q^{-1}

Items (Birr q^{-1})	Producers	Wholesalers	Retailers	Horizontal sum
Purchase prices	_	711.39	1050	1,761.39
Production cost	189.56	_	_	189.56
Marketing cost				
Human labor	8	10	_	18
Transportation cost	17.5	28.36	10	55.86
Product loss	18.99	32	33.47	84.46
Value added costs	20.75	10	12.35	43.10
Tax/Commission	10	15	11	36
Over head costs	11	0.85	4	14.85
Total marketing costs	86.24	96.21	70.82	253.27
Total costs	275.8	807.6	1,120.82	2,204.22
Sales prices	711.39	1050	1,356.25	3,117.64
Market margin	521.83	338.61	306.25	1,166.69
% share of margin	44.73	29.02	26.25	100
Profit margin	435.59	242.4	235.43	913.42
% share of profit	47.69	26.54	25.77	100

Source: Own calculation based on study data, 2014/15

Table 10. Value added activities costs at each chain actors q^{-1}

Activities	Costs incurred (Birr q^{-1})		
	Producer	Wholesaler	Retailer
Cleaning	5.5	-	1.76
Curing	2.0	-	-
Sorting	3.25	-	0.59
Packaging	10	10	10
Total	20.75	10	12.35

Source: Own calculation based on study data, 2014/15

packaging activities while wholesalers performing only packaging activities to facilitate transportation activities. Retailers performed value added activities like cleaning and sorting to attract their customer in some amount. This showed that the value added activities those are important to keep the quality and increasing shelf life of onion produce were not properly performed in the study areas. The survey result of key informant also revealed that the understanding of value chain actors on the areas of value addition and its importance were low.

Performance, marketing margins and profit of different channels

The performance of onion market was evaluated by considering associated costs, returns, profits and marketing margins. The distribution of costs and gross income at different levels is important in the business of onion. The marketing cost includes cost of packaging (material and labor costs), handling (sorting, cleaning, loading, and unloading), and transportation and tax/commission costs. The margin calculation was done to show the distribution throughout the various actors as product move from production to wholesalers, retail markets, and finally to consumers. The relative size of various market participants' gross margins can indicate the share of particular actor in the market. In order to calculate the marketing margin of an agent, the average price of onion for that particular agent was taken.

Marketing margins of onion in the four channels for each group of market players are given below (Table 11). GMMp, GMMr and GMMw are gross marketing margins of producers, retailers, and wholesalers, respectively. NMMp, NMMr and NMMw are net marketing margins of producers, retailers and wholesalers, respectively.

The marketing margin analysis result showed that retailers have got the highest gross marketing margin of 53.63% (625.65 Birr q^{-1}) in channel II, while wholesalers have got the highest gross marketing margin of 55.29% (625.36 Birr q^{-1}) in channel III. This highest marketing margin of the wholesalers and retailers are due to they are directly sold the produce to consumers without other intermediaries. Wholesalers and retailers have got the lowest marketing margin of 29.02% (338.61 Birr q^{-1}) and 26.25% (306.25 Birr q^{-1}) in channel IV, respectively. Without considering channel I (producers sell directly to consumer) producer's share highest gross marketing margin of 46.37% (454.8 Birr q^{-1}) from the total consumers' price in channel II. This indicated that as intermediaries are added to the onion marketing channel the gross marketing margin of producers and other actors involved in marketing activities are decreased in the study areas.

Regarding to net marketing profit of traders; marketing profit of wholesalers was highest 55.77% (Birr 549.15 q^{-1}) in channel III. This profit was made possible due to the by-passing of other middlemen (retailers) intervening between producers and consumers. Retailers also obtained highest profit 54.95% (554.83 Birr q^{-1}) in channel II due to the absence of intermediaries (wholesalers) and direct sale to consumers. This indicated that as the producers add value to their produce and participate in marketing activities of their produce though their association, their net marketing profit margin increases.

Econometric model results

The explanatory variables such as sex of household, age of household, access to credit

Table 11. Onion marketing performance of different channels in the study areas

Actors	Items	Marketing channels			
		I	II	III	VI
Producer	Selling price	738.64	730.6	711.39	711.39
	Production cost	189.56	189.56	189.56	189.56
	Marketing cost	86.24	86.24	86.24	86.24
	GMMp (%)	100	46.37	44.71	44.73
	NMMp (%)	100	45.05	44.23	47.69
Wholesaler	Purchasing price	-	-	711.39	711.39
	Marketing price	-	-	96.21	96.21
	Selling price	-	-	1356.75	1050
	GMMw (%)	-	-	55.29	29.02
	NMMw (%)	-	-	55.77	26.54
Retailer	Purchase price	-	730.6	-	1050
	Marketing cost	-	70.82	-	70.82
	Selling price	-	1356.25	-	1356.25
	GMMr (%)	-	53.63	-	26.25
	NMMr (%)	-	54.95	-	25.77
	TGMM (%)	0	46.13	47.55	47.55

Source: Own computation from study result, 2014/15

service, market information and distance to market center were insignificant to determine the marketable supply of onion in study areas. Since both male and female household respondents take part in production, management and marketing activities of crops, previously the sign of prior assumption of sex on marketable supply of onion was not hypothesized. This econometric analysis also revealed that sex of household was insignificant to determine marketable supply of onion in the study areas. This might be due to both male and female households participated in marketing activities of onion in the study areas.

In theory, if farmers are accessed to credit they can purchase different inputs required for production activities and as a result the production and marketable supply are affected positively. However, the result of this econometrics analysis showed that access to credit was insignificant to determine marketable supply of onion in the study areas. This might be due to limited access of credit and credit amount given for producers as it was stated a problem by members of focus group discussions. This implied that if farmers are accessed to small amount of credit due to different problems associated to accessing credit; the farmers might not be allocated the credit amount properly for production purpose. Thus, the credit accessed might be insignificantly influenced marketable supply.

The econometrics analysis also showed that age of household respondents was insignificant to determine marketable supply of onion in the study areas. This might be due to the age of all household respondents were in productive age; as a result they are actively participated in crop management and marketing activities. Similarly, access to market information was insignificant to determine marketable supply of onion in the study areas. The study showed that there was no organized market information provided in regular manner for

producers. Thus, this quality problem of market information might be the cause for insignificance of this variable to determine the marketable supply in the study areas. Distance to market center also other variable insignificant to determine marketable supply of onion in the study areas. Because of rural road expansion opportunity existed in study areas the farmers far from market center also supply their produce to market as those near to market center. Thus, this might be the reason for insignificance of distance to market center to influence marketable supply in this econometrics analysis.

The separate econometrics analysis result of Ambo district showed that land used for onion farming, experience on onion farming and amount of fertilizer used were positively and significantly influenced the marketable supply of onion. Similarly, land used for onion farming, number of oxen owned, experience on onion farming, amount of fertilizer used and access to extension service were positively and significantly influenced marketable supply of onion in Toke Kutaye district. The descriptive analysis also showed higher yield/ha of onion was recorded in Ambo district than Toke Kutaye district. This analysis also revealed that number of oxen owned, amount of fertilizer used, experience on onion farming and access to extension service had positive relationship with yield ha^{-1} of onion in the study areas. The above two analyses indicated that these variables had strong direct relationship with yield ha^{-1} and marketable supply of onion in the study areas.

Onion is one of the most commonly produced vegetable crops in the study areas. The study revealed that most of the onion product was produced for marketing purposes. The results of the study indicated that onion passes through different channels until it reaches the final consumers from the shortest channel (when the farmer directly sells their products to the consumers) to the longest channel (Producers to collectors to wholesalers to retailers to the final consumers). Even though there were different channels through which onion produces passed, the farmers benefit was lower than that of other actors in the channels; the marketing costs of wholesalers were higher than the other value chain actors and the average percentage of profit obtained by the retailer was higher (39.32%) but the profit of the farmers/producers was only 17.9%. The econometric results also indicated that the selling price affected the volume of onion supplied to the market positively and significantly, and multiple linear regression model was revealed that highly significant independent variables like age, farm experience, size of the family, selling price and improved inputs were found significant and affected onion marketable supply out of the expected ones. Thus, to increase the onion productivity, market channel and performances of all actors for the maximization of the profits of all value chain actors, it is important to integrate all concerned bodies of the onion value chains along with the supporting sectors.

Table 12. Econometric result of determinants of marketable supply of onion

Qosm	Coef.	Robust Std. Err.	t	P>|t|
_cons	-9.274391	2.135569	-4.34	0.000
Aghh	-0.0541603	0.0429509	-1.26	0.209
Sexhh	-0.6156899	0.972649	-0.63	0.528
Edulhh	1.766469	0.7860107	2.25**	0.026
Dismceer	0.0331467	0.05395	0.61	0.540
Fshh	-0.4480896	0.2479155	-1.81*	0.073
Lonfm	83.8	7.428943	11.28***	0.000
Noxown	1.334239	0.5784878	2.31**	0.023
Exponfar	1.076063	0.5227018	2.06**	0.041
Amfertused	0.1630371	0.0595205	2.74***	0.007
Accrdit	0.3628946	0.9166741	0.40	0.693
Aexser	2.373283	0.8192716	2.90***	0.004
Aminfo	1.046248	0.9011653	1.16	0.248
R-squared (R^2)				0.9549
F			171.02***	0.0000
N				151

Note: ***, ** and* are significant at 1%, 5% and 10% significance level, respectively

References

ADAO (Ambo District Agricultural Office) 2014 Ambo District Agricultural Office annual plan. Ambo, Ethiopia, pp.2–4.

Adugna G 2009 Analysis of fruit and vegetable market chains in Alamata, Southern zone of Tigray: the case of onion, tomato and papaya. Haramaya University, Ethiopia, pp.14–80.

Almaz G, Workneh N, Edilegnaw W & Gezahegn A 2014 Constraints of vegetables value chain in Ethiopia: A gender perspective. Intl. J. Adv. Res. Manag. Social Sci. 3: 64.

Astewel T 2010 Analysis of rice profitability and marketing chain: The case of Fogera Woreda, South Gondar Zone, Amahara National Regional State, Ethiopia. M.Sc. Thesis presented to School of Graduate Studies, Haramaya University, pp.76.

ATA (Agricultural Transformation Agency) 2014 Transforming Agriculture in Ethiopia, Annual Report, pp.3–8.

Ayelech T 2011 Market chain analysis of fruits for Gomma woreda, Jimma zone, Oromia National Regional State. M.Sc. Thesis presented to School of Graduate Studies, Haramaya University, Ethiopia, pp.110.

Bezabih E 2010 Market assessment and value chain analysis in Benishangul Gumuz Regional State: Final Report Ethiopia, pp.1–2.

Dawit A, Abera D, Lemma D & Chemdo A 2004 Domestic vegetable seed production and marketing. Research Report No 5. EARO, Ethiopia, pp.17.

Dolan C & Humphrey J 2004 Changing Governance Patterns in the Trade in Fresh Vegetables between Africa and the United Kingdom. J. Environ. Planning 36: 491–509.

FAO (Food and Agriculture Organization) 2005 FAO Production year book 2006, Basic data unit, statistics division, FAO, Rome, Italy, No.55, pp.125–127.

Greene W 2000 Econometric Analysis. 4th Edn. NJ: Prentice Hall, Englewood Cliffs.

Gujarati D 2003 Basic Econometrics. 4th Edition. McGraw-Hill, New York, pp.563–636.

Mendoza G 1995 A primer on marketing channels and margins. In: Scott G J (Eds.). Prices, Products, and People: Analyzing Agricultural Markets in Developing Countries. Lynne Reiner Publishers, Boulder, London, pp.257–275.

Olani N & Fikre M 2010 Onion seed production techniques; a manual for Extension Agents and Seed Producers, Asella, Ethiopia, pp.1–13.

TKAO (Toke Kutaye Agriculture Office) 2014 Toke Kutaye Agriculture Office annual plan, Guder, Ethiopia, pp.1–2.

UNIDO (United Nations Industrial Development Organization) 2009 Agro-value chain analysis and development: a staff working paper, Vienna, pp.4–5.

Yamane T 1967 Statistics, an Introductory Analysis, 2nd Ed., New York: Harper and Row.